

REMARKS/ARGUMENTS

The Office Action of December 3, 2003, has been carefully considered.

It is noted that claim 20 is rejected under 35 U.S.C. §112, second paragraph.

Claims 20, 21, 25, 26, 29, 34-39, 49, 52-57, 65 and 66 are rejected under 35 U.S.C. §102(b) over the patent to Blakeley et al.

Claims 22, 28, 30-33 and 45 are rejected under 35 U.S.C. §103(a) over Blakeley et al.

Claims 23, 24, 27, 42-44, 46-48 and 60 are rejected under 35 U.S.C. §103(a) over Blakeley et al. in view of the patent to Reese, Jr.

Claim 40 is rejected under 35 U.S.C. §103(a) over Blakeley et al. in view of Reese, Jr., and further in view of European reference 0528131 to Kawai.

Claim 41 is rejected under 35 U.S.C. §103(a) over Blakeley et al. in view of Kawai.

Claims 50-51 are rejected under 35 U.S.C. §103(a) over Blakeley et al. in view of the patent to Komai et al.

In view of the Examiner's rejections of the claims, Applicant has amended claims 20 and 66.

It is respectfully submitted that claim 20 particularly points out and distinctly claims the subject matter which Applicant regards as the invention. Applicant has amended this claim to only recite that the elastic modulus and/or the coefficient of thermal expansion changes along the coupling layer. What is intended by this language is that the coupling layer has an elastic modulus and/or a coefficient of thermal expansion that changes from a region of contact with the insert and a region of contact with the plastic material so that differences in the elastic modulus and/or the coefficient of thermal expansion between the plastic material and the insert are minimized.

In view of these considerations, it is respectfully submitted that the rejection of claim 20 under 35 U.S.C. §112, second paragraph, is overcome and should be withdrawn.

It is respectfully submitted that the claims presently on file differ essentially and in an unobvious, highly advantageous manner from the constructions disclosed in the references. Applicant has once again attempted to amend claim 20 to clarify the differences between the presently claimed invention and the disclosure of Blakeley et al. Applicant believes that the version of claim 20 submitted with the last filed Amendment is distinguishable from this reference, however, rather than file an appeal at this time, Applicant has attempted to revise the language of the claim to make the

differences more apparent to the Examiner.

In paragraph 12 of the Office Action, where the Examiner answers arguments presented in the last filed Amendment, it appears that the Examiner has taken some of those arguments out of context. For example, in the last paragraph beginning on page 11 of the Office Action, the Examiner states “Applicant also argues, on page 12, that Blakeley et al. do not disclose an intermediate layer between the first portion and composite material. However, claim 20 is not directed to an intermediate layer between the insert portion and composite material; it is directed to an intermediate layer which is arranged to join the insert to the plastic material.” In making this argument, Applicant was not intending to imply that claim 20 is directed to an intermediate layer between an insert portion and a composite material. The passage which the Examiner has cited from Applicant’s argument has a different meaning when read in context with the three sentences on page 12 prior to the passage quoted by the Examiner. Upon reading these three sentences, the Examiner will see that the Applicant was comparing the elements of Blakeley et al. with the elements of the presently claimed invention. For example, Applicant stated “Blakeley et al. disclose a composite turbine blade 1 which corresponds to the plastic structure element according to the presently claimed invention. The composite blade comprises a root attachment 2 (which corresponds to the insert according to the present invention) with an insert portion 3 (which corresponds to the length of the insert imbedded in the plastic material), where this insert portion 3 is integrally molded within the composite material of the turbine blade.” Since the insert portion 3 of Blakeley et al. corresponds to the length of the insert imbedded in the plastic material of the present invention, and since the composite material of Blakeley et al. corresponds to the plastic material of the present invention, Applicant was making the point that Blakeley et al. do not have an intermediate layer between the insert portion and the composite material and therefore they do not teach an intermediate layer between an insert and plastic material as in the presently claimed invention.

Further, evidence of the Examiner’s misunderstanding of the invention is the sentence bridging pages 11 and 12 of the Office Action. Here the Examiner states “Furthermore, Blakeley et al. disclose that the composite material comprises multiple layers of epoxy sheets (column 5, lines 1-21); every sheet of the composite material is therefore arranged to join the insert to the plastic material, and any sheet which is not in direct contact with the insert constitutes an intermediate layer.”

Claim 20, as previously written, and more so as amended, nowhere states that the intermediate layer is not in contact with the insert. In fact, upon reading the specification of the present application, it would be clear to those skilled in the art that the coupling layer is in fact in contact with the insert. Applicant has amended claim 20 to make this point unambiguous. By the Examiner stating that “any sheet which is not in direct contact with the insert constitutes an intermediate layer” evidences that the Examiner does not understand the present invention. Using the Examiner’s understanding, what is the sheet in direct contact with the insert considered? It seems to Applicant that the Examiner is reading the claims out of context from the description found in the specification of the present application. In any case, Applicant has amended claim 20 in an effort to once again clarify the claims so that they distinguish over the cited references to the Examiner’s satisfaction. A further clarification included in claim 20 is that the coupling layer is of a different material than the plastic material. This is not disclosed by Blakeley et al. The Examiner argues that the various sheets of epoxy resin containing fibers, which form the turbine blade, also form the intermediate coupling layer. Thus, Blakeley et al. do not disclose a coupling layer or intermediate layer that is of a different material than the reinforced plastic fiber material of the turbine blade, no matter which layer of the turbine blade is considered. Furthermore, Blakeley et al. disclose in column 1, lines 43-47 that long fibers from the composite blade, i.e., from the plastic matrix have been wound around the spade, i.e., the insert. A principle of the Blakeley et al. solution is not to build a coupling layer with fibers which equilibrates the differences of the elastic modulus and/or the thermal expansion between the insert and the plastic matrix. The object of Blakeley et al. is to bring forces acting on the insert into the plastic matrix via the fibers adhering at the spade at one end and being embedded in the plastic matrix at the other end. This is completely contrary to the presently claimed invention in which the fibers of the coupling layer are not in any way embedded in the plastic matrix of the composite part.

Additionally, the Examiner states that the phrase “with the coupling layer having a volume fraction of fibers, type of fibers, length of fibers and alignment of fibers, or fiber layers ... whereby the coefficient of the thermal expansion between the plastic material and the insert are equilibrated so that differences in the coefficient of thermal expansion of the interface between the plastic material and the insert are minimized” is only a desired result. Applicants take issue with this conclusion by the Examiner. Yes, a desired result is mentioned, namely the minimizing of the differences in the

coefficient of thermal expansion and/or the elastic modulus, however, there is also structure recited for obtaining this desired result and that structure is the recitation of the volume fraction which is claimed. These mechanical properties are clearly structural in nature and Blakeley et al. make no teaching concerning structures such as these.

Relative to claim 65, Applicant respectfully submits that Blakeley et al. do not disclose apertures as recited in the presently claimed invention in the insert. The Examiner argues that the fibers are “laminated into the plastic so as to anchor the insert, and are joined to the insert by a loop connection.” Although the fibers of Blakeley et al. may project away from the resin body and engage somehow into the plastic material in some sort of a loop connection as argued by the Examiner, Applicants can find no support for this “loop connection” in Blakeley et al. Furthermore, Blakeley et al. do not disclose an aperture in the insert. An aperture is clearly, as recited in claim 65, a hole through which another material, separate from the plastic material, can be looped and intermittently joined to the plastic matrix of the plastic structural element. No where do Blakeley et al. in any way mention an insert having apertures having fibers, strands or materials looped therethrough as in the presently claimed invention.

Relative to claim 66, the Examiner once again argues that a desired result is being claimed rather than a structural limitation. Applicants once again submit that a structural limitation is being claimed. Claim 66 has been amended in an effort to clarify this to the Examiner. As presently written, the embedded length of the insert is configured to reduce a geometrical moment of inertia of the imbedded length. Clearly the shape of the embedded length is being claimed which is well understood to be a structural limitation.

Thus, in summary, Applicant submits that Blakeley et al. do not disclose an intermediate coupling layer between an insert and a plastic material, which coupling layer is of a material different from the plastic material, and which coupling layer has a certain volume fraction of fibers, types of fibers, length of fibers and alignment of fibers or fiber layers so that the elastic modulus and/or the coefficient of thermal expansion of the coupling layer changes so as to equilibrate the coefficient of thermal expansion and the elastic modulus between the plastic material and the insert so that differences between the elastic modulus and/or the coefficient of thermal expansion at an interface between the plastic material and the insert are minimized.

In view of these considerations, it is respectfully submitted that the rejection of claims 20, 21, 25, 26, 29, 34-39, 49, 52-57, 65 and 66 under 35 U.S.C. §102(b), and the rejection of claims 22, 28, 30-33 and 45 under 35 U.S.C. §103(a) over the above-discussed reference are overcome and should be withdrawn.

As for the remaining references which were cited in various combinations of Blakeley et al. in rejecting various of the dependent claims, these references have also been considered. Since they do not come closer to the currently claimed subject matter than the reference discussed above, it is believed that any detailed comments thereon at this time would be superfluous.

In view of these considerations, it is respectfully submitted that the rejection of claims 23, 24, 27, 40-44, 46-48, 50, 51 and 60 under 35 U.S.C. §103(a) are overcome and should be withdrawn.

Reconsideration and allowance of the present application are respectfully requested.

In the event the actual fee is greater than the payment submitted or is inadvertently not enclosed or if any additional fee during the prosecution of this application is not paid, the Patent Office is authorized to charge the underpayment to Deposit Account No. 15-0700.

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as First Class Mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on March 3, 2004:

Klaus P. Stoffel

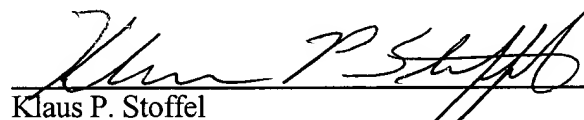
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March 3, 2004

Date of Signature

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